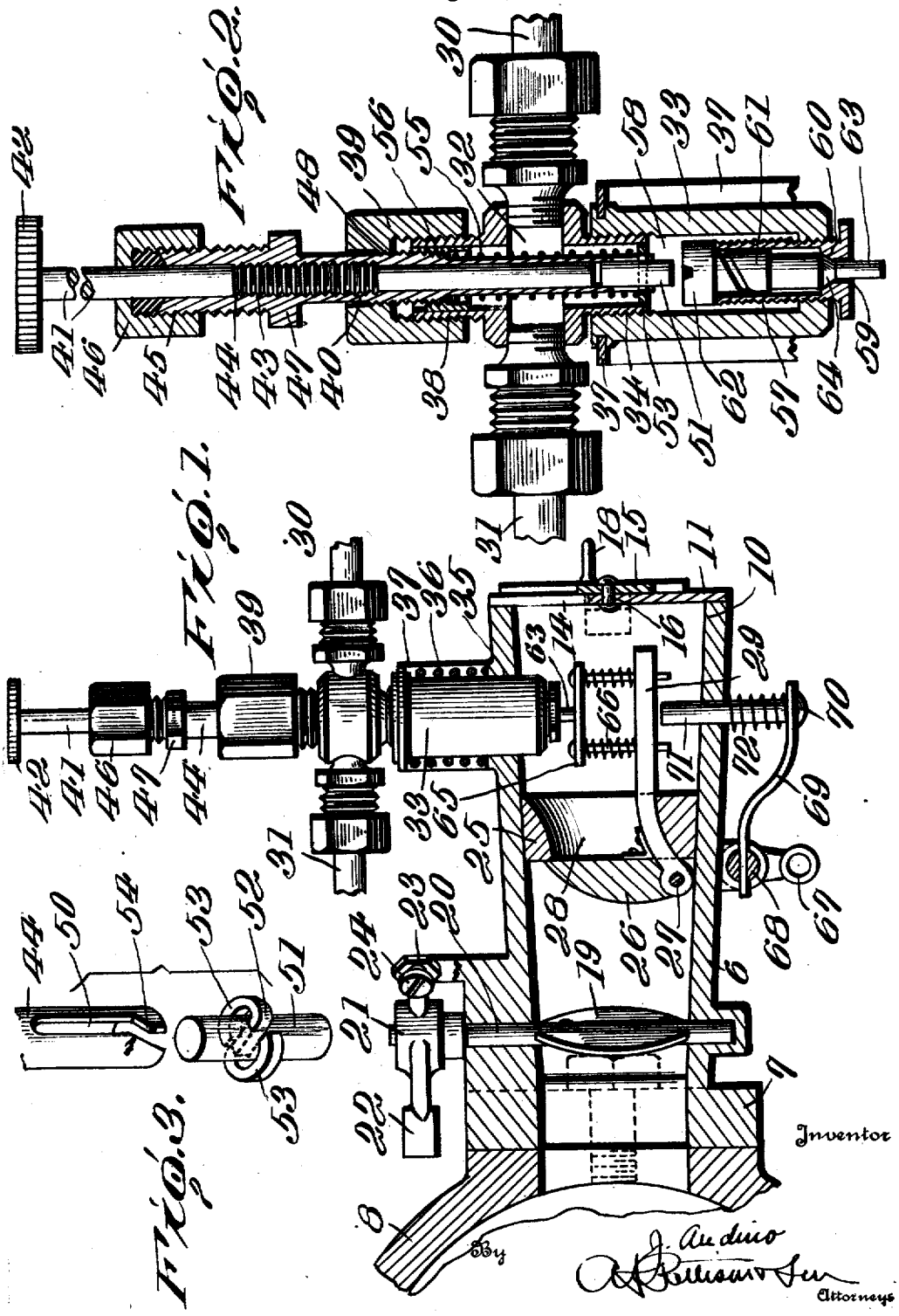
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CARBURETOR

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CARBURETOR.

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This invention relates to improvements in carburetors, being an improvement upon the carburetor shown and described in my pending application entitled Carburetors, bearing Serial Number 76,789, which was filed December 21st, 1925, and similarly pertaining particularly to a carburetor in which no float is utilized, a direct flow of liquid fuel being fed to a motor. The flow of fuel is controlled by an automatic feed which, as a matter of fact, takes the place of the float as found in the common and well-known type of carburetors now on the market.

In the present invention the improvement lies primarily in the feed control device which is constructed in a manner to provide a better mixture and fuel control when the engine is idling.

The primary object of the invention is the provision of a carburetor whereby the motor fuel can be fed directly to the motor.

A further object of the invention is the provision of a carburetor in which the motor fuel is fed directly to the motor and the provision of automatic means controlled through the medium of the engine speed for controlling the feed of the fuel to the motor.

Another and further object of the invention is the provision of a carburetor of the character described which will increase the liquid fuel mileage and prevent the engine knocking.

Another and still further object of the invention is the provision of a carburetor of the character described, which is constructed in a manner to prevent fire in case of the engine "back-firing."

A still further object of the invention is the provision of a carburetor of the character described, which is cheap and simple of manufacture and readily adaptable as a replacement to the common form or carburetor usually found in use on hydrocarbon motors.

Another object of the invention is the provision of novel means for controlling and adjusting the amount of fuel fed to the motor when the motor is idling, as well as when the motor is running at higher speed.

Other further objects and novel features of construction and improved results of the invention will appear in the following description and accompanying drawing.

In the drawing:—

Figure 1 is a vertical sectional view of a carburetor built in accordance with the invention.

Fig. 2 is an enlarged vertical sectional view of the fuel feed control.

Fig. 3 is an enlarged detail view showing the manner of attaching the pin in the lower end of the adjusting screw.

Referring to the drawing in which like parts are designated by similar reference numerals throughout the description, 6 designates the main body or casting of the carburetor, which is provided at its one end with a flange 7, for fastening the carburetor to the intake manifold 8 of a hydrocarbon motor or the like.

The casting or main body portion of the carburetor is internally tapered slightly towards its open end 10, whereby this end of the body portion is slightly larger in diameter than the opposite inner end 7 thereof. A door 11 is provided for closing the open end of the casting, the door being provided with an opening 14 to permit the passage of air into the carburetor and intake manifold. The control of air to the carburetor and engine is controlled through the medium of a shutter 15, which is pivotally mounted as at 16, so as to control the size of the opening 14 in the door. The shutter is provided with an operating handle 18.

A common form of butterfly valve 19 is mounted adjacent the inner end of the main carburetor housing or casting, the construction of this valve being conventional in that the valve 19 is carried by a rotatably mounted shaft 20, which has its upper end extending through the carburetor casting and being provided with a bell-crank 21. One end 22 of the bell-crank is adapted to be connected with an operating member (not shown) which is usually lead for the sake of convenience to the dash-board of the vehicle, or to such other convenient position as to be readily accessible for operation. There is also provided the conventional form of stop 23, which is adapted to be engaged by the stop member 24, which forms a part of the bell-crank.

A regulator comprising a washer-shaped member 25, and a flap-valve 26 is situated within the carburetor housing, being preferably positioned at a point approximately intermediate its ends. Due to the tapered inner walls of the carburetor or of the housing or casting 6, the washer-like member 25 is wedged and rigidly held in place, although, if desired, a set-screw may be provided, which penetrating the outer wall of the carburetor,

will engage this member further locking it in position.

As clearly appears in Fig. 1 of the drawing, the flap valve 26 is pivotally mounted on the washer-like member as at 27, and in its normal position closes the opening 28 in the washer. A lever 29 is rigidly attached to the flap-valve so as to move therewith, this lever extending through the washer opening 28 to a point well in front thereof.

The gasoline or other motor fuel is fed to the carburetor through the medium of two supply pipes 30 and 31, which makes it possible to feed simultaneously two fuels of different characters and blend them immediately before feeding them to the carburetor and engine. The supply pipes are in communication with the chamber 32, which is mounted above the plug or housing 33, being screw-threadedly attached in the upper end thereof, as at 34. The plug or housing 33 is constructed to provide a close sliding fit in the opening 35 in the carburetor casting 6, being held in place under resilient pressure as of the pressure of spring 36, which exerts an upward pressure upon the L-shaped bracket 37, is offset by a second spring (not shown) which exerts a downward pressure upon the bracket at the point where it is attached to one side of the carburetor casting.

The chamber 32 is provided with an upwardly extending threaded end 38, which carries a packing nut 39, provided centrally with an opening 40, through which extends the adjusting stem 41, provided at its upper end with a knurled head 42. The adjusting stem 41 is carried screw-threadedly as at 43, in a hollow tube 44, the upper end of the tube 44 is threaded as at 45 and carries a packing nut 46. The tube is further provided with a squared or nut-portion 47, through the medium of which the tube can be rotated.

Below the nut portion 47 the tube is externally threaded as at 48, and these threads engage the threaded opening 40 of the packing-nut 39.

The lower end of the tube 44 is provided with slot-like openings 50. Mounted in the lower end of the tube is a pin 51, a portion of which is in the tube, while a portion of the pin extends from the end of the tube. The pin is provided with an S-shaped fastening member 52. This fastening member passes through the pin and has the S-shaped portions 53 at each side of the pin. The center bar, or portion of the S-shaped member is adapted to slide in the slots 50, and when in position the tube is between the pin and the extending portions 53. The ends of the slots 50 are offset as at 54, so that when the pin and its fastening member are pushed upwardly into the slot and slightly rotated the pin cannot drop out.

Supported upon the fastening member 52 and surrounding the rotatable tube 44 is a coil spring 55 the upper end of which engages the tapered portion 56 of the tube. From this construction it will be apparent that the tension of the spring is adjustable by the mere rotation of the tube 44 in the nut 39.

Referring now to the housing 33, it will be seen that there is mounted in the lower end thereof a sleeve 57, which extends upwardly into the chamber 58 of the housing.

This sleeve at its lower end is provided with an opening 59, the inner end of which is formed in a tapered valve-seat 60. A needle valve 61 is mounted for reciprocation in the sleeve 57 and is provided with an enlarged head 62, while its opposite end is reduced and extends outwardly and downwardly beyond the housing, as at 63. Immediately above the reduced end of the needle valve, it is provided with a taper 64, adapted to seat upon the tapered inner end of the opening 60.

A plate 65 is suitably mounted on coiled springs 66, which are in turn positioned on the upper face of the control lever 29. This plate is normally in engagement with the outwardly extending end 63 of the needle valve.

A manual control for the flap valve 26 is provided in the form of a bell-crank 67, which is adapted to operate the shaft 68, which in turn operates the forwardly extending arm 69, which is provided in its end with a cup-shaped depression 70, which engages the rod 71. The rod 71 extends through the carburetor body or casting and upon the operation of the bell-crank lever will engage the control lever 29 to raise this lever for the purpose of opening the needle valve. The rod 71 is normally in the position shown in Fig. 1 of the drawings, by reason of the coil spring 72.

A suitable connection (not shown) is led from the bell-crank 67 to a point of convenience for operation.

Attention is called to the fact that the needle valve 61 is provided with helical grooves 80 and that by reason of these grooves, fuel feed to the carburetor is assured even when the needle valve is lifted only slightly from its seat.

Operation.

With the parts in the position shown in the drawings, the gasoline feed to the motor is closed. To enable the starting of the motor, it is necessary to actuate the primer which comprises the operating arm 69 and its rod 71, to raise the flap valve lever 29, which will cause the plate 65 to lift the needle-valve and permit the passage of liquid fuel to the motor, it being understood when the arm 29 is elevated, the flap valve 26 is carried to an open position. In starting the motor the throttle control is always open and for this reason the butterfly valve, which is actuated

through throttle control, will be in open position and will permit the suction of liquid fuel into the intake manifold of the engine.

After the engine is started, the operation of the carburetor is automatic. As the butterfly valve is opened wider a greater suction is created in the carburetor and this suction working on the flap-valve will pull this valve open and in so doing will elevate the outer end of the control valve 29, which will in turn lift the needle-valve higher to permit the passage of a greater amount of fuel to the engine. The automatic operation of the carburetor can be controlled, to a large degree, by the position of the shutter 15, as the engine can suck a volume of air through the carburetor in amounts in proportion only to the size of the orifice or opening 14.

In a carburetor of the character here present, it is necessary that the construction be such that the amount of fuel fed to the motor when idling can be adjusted as well as to provide adjustment for the amount of fuel when it is fed to the motor when it is running at higher speeds. The adjustment of the fuel feed for idling is had through the tube 44 and pin 51. When the motor is running slowly, the suction upon the flap-valve is very slight, and the upward force upon the lower end 63 of the needle-valve is not great. For this reason the carburetor feed control is set so that there is a clearance between the pin 51 and the head 62 of the needle-valve. The amount of clearance is adjustable by turning the tube 44 down or up in the nut 39. By reason of the clearance between the pin and the upper end of the needle-valve the motor when idling need only lift the weight of the needle-valve to permit the passage of a small amount of fuel into the carburetor. When the motor is being run at a higher speed, however, the needle-valve head will engage the pin 51 and must raise this pin in the tube slot 50 against the tension of the coiled spring 55. The tension of the coiled spring 55 is adjustable through the medium of a nut 56.

The extreme open position of the needle valve is controlled through the adjusting stem 41. As clearly appears in Fig. 2 of the drawings, this stem is rotatable in the tubing above the stem 51, and can be set so that the lower end of the stem will engage and stop the upward movement of the pin 51, and consequently the needle-valve 61, at any position throughout the length of the slots 50.

Having thus described my invention, what I claim and desire to secure by Letters Patent is:

1. A carburetor comprising a housing having an air-intake and a fuel valve, means actuated by an intake of air to operate said valve, a yieldably mounted pin located to regulate the movement of the valve throughout a portion only of its travel, said pin being adjustable in respect to the valve, and a stop adjustable in respect to said pin for positively limiting the movement of the valve.

2. A carburetor comprising a housing having an air-intake and a fuel valve, means actuated by the intake of air to open said valve to permit the inflow of fuel, a pin yieldably mounted above said valve and slightly separated therefrom, said pin adapted to be engaged by the upward movement of the valve to regulate the movement thereof, and means to regulate the yieldable tension on said pin.

3. A carburetor comprising a housing having an air-intake and a fuel valve, means actuated by the intake of air to operate said valve to lift the same and permit the inflow of fuel, a tube mounted in the fuel line above said valve, a pin mounted in said tube for reciprocation against spring tension, means to regulate said tension, said pin slightly separated from the fuel valve and adapted to be engaged by the valve upon its upward movement, and adjustable means in said tube for positively stopping the upward movement of the pin and the fuel valve.

4. A carburetor comprising a housing having an air-intake and a fuel valve, means actuated by the intake of air to operate said valve, a tube mounted in the fuel line above the valve and carrying a pin mounted for reciprocation against spring tension, an adjustable stop mounted in the tube above the pin for limiting the movement thereof, means to adjust the spring tension upon the pin, and the tube adjustable in respect to the valve, whereby the parts can be arranged so that the valve is moved against an adjustable spring tension throughout a portion of its travel and the upward movement of the valve can be arrested at any desired point throughout its travel.

5. A carburetor comprising a housing having an air-intake and a fuel valve, means actuated by the intake of air to operate said valve, a yieldable pin located to regulate the movement of the valve throughout a portion only of its travel, and means to regulate the tension upon said yieldable pin, whereby the valve lifts during the first part of its travel against gravity and throughout a predetermined distance of the travel against an adjustable spring tension.

6. A carburetor comprising a housing having an air intake with a fuel inlet in its top, a valve normally closing said inlet, a flap valve in said air intake and normally closing the same, means mounted below said fuel valve and actuated by said flap valve for lifting the fuel valve and permitting the inflow of fuel, a tube mounted in the fuel line above said fuel valve and fuel inlet, a pin mounted in said tube for reciprocation against spring tension, means to regulate said ten-

sion, above said pin and slightly separated from the fuel valve and adapted to be engaged by the valve upon its upward movement, an adjustable stop mounted in the tube above the pin for positively limiting the upward movement thereof, and the tube adjustable in respect to the valve, whereby the parts can be arranged so that the first movement of the valve is against the force of gravity and a continued movement of the valve is against the adjustable and yieldable tension of the pin and the upward movement of the valve can be arrested at any desired point throughout its travel.

7. A carburetor comprising a housing constituting the carburetor air intake, a hollow plug having therein a valve and a set therefor, said plug positioned in the upper face of said air intake housing and constituting a fuel inlet, the fuel valve in said plug having an end extending beyond the plug and into the air intake, means in said air intake below said valve and actuated by the passage of inlet air for raising and lowering said valve, a fuel line communicating with said plug, a tube in said fuel line, a pin yieldably mounted in said tube and positioned slightly above and in separated relation in respect to the fuel valve, an adjustable stop in said tube above said yieldably mounted pin, and said tube, pin and stop adjustable as a unit to and from said fuel valve, for the purpose described.

In testimony whereof I hereunto affix my signature.

JOSEPH AUDINO.